# Gleaner

MARCH 6, 1964

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# The Gleaner

Delaware Valley College of Science and Agriculture

Vol. LXIII March 6, 1964 No. 2

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## Our Cover

An achievement for which the Animal Husbandry Club can be proud. A Pennsylvania Farm Show Blue Ribbon caps many hours of careful attention and persistence to come up with a Reserve Grand Champion. Net result: Knowing how to produce the best. Students shown with the championship bull are; Douglas R. Brown '63, Edward Prigge '64, Max Heflich '63, and M. Peter Hoffman '63.

*The Gleaner* *established 1901*

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# Resolution

In the Senate,
July 29, 1963

Fifteen years ago after fifty years of service, The National Farm School and Junior College became Delaware Valley College of Science and Agriculture.

During its first fifty years the philosophy of the School was contained in the ideals of the Founder, Joseph Krauskopf. His philosophy was contained simply in the development of character, of tolerance and the ability to think, the acceptance of faculty and students without regard to race and creed, the teaching of both theory and techniques, and the offering of the advantages of the School to any qualified student regardless of his economic position.

The policies of the School have been accepted and continued by the College. The youngest college in the Commonwealth, in fifteen years it has grown tenfold in enrollment, has been accredited by Middle States Association of Colleges and Secondary Schools, has broadened its program to include majors in the sciences, a broad education in the liberal arts, and an evening school.

Not unlike Samson of yore, whose magic locks of strength grew in a short time, The Delaware Valley College of Science and Agriculture emerged within a brief span of fifteen years as one of the most progressive colleges in the Commonwealth. It has projected a development plan envisioning an increase in enrollment of over one hundred per cent in the next decade, and a further expansion of its service to the entire community.

Situate on "Acres of Emeralds" in the heart of historic and panoramic Bucks County, The Delaware Valley College of Science and Agriculture forged to the very vanguard of Pennsylvania's seats of higher learning, adding immeasurably to the growth of Pennsylvania's most rapidly progressing Bucks County.

It is the dedication of its Board of Trustees, the vision and superb leadership of Dr. James Work, its indefatiguable President, together with a faculty renowned for learning and advanced research, that brought about the miraculous growth of the Delaware Valley College of Science and Agriculture.

NOW, THEREFORE, BE IT RESOLVED, that the Senate of Pennsylvania on the occasion of the celebration of the fifteenth anniversary of the Delaware Valley College of Science and Agriculture extends in behalf of the People of Pennsylvania its commendations and congratulates the members of its Board of Trustees, the members of its Faculty, and its President, Dr. James Work; and

BE IT FURTHER RESOLVED, that the Secretary of the Senate be directed to forward a copy of this resolution to Dr. James Work, President of The Delaware Valley College of Science and Agriculture.

I certify that the foregoing is a true and correct copy of Senate Resolution Serial No. 90, introduced by Senators Marvin V. Keller and Israel Stiefel and adopted by the Senate of Pennsylvania the twenty-ninth day of July, one thousand nine hundred and sixty-three.

Mark Gruell, Jr.

MARK GRUELL, JR.
Secretary
SENATE OF PENNSYLVANIA

# Editor's Notes

## Letter from the President

The entire staff of the Gleaner is to be congratulated upon the results of the endeavors of the new organization as seen in the December issue.

This issue marks another step forward in the sort of activity which really builds the image of the College in the minds of all of those who know us. The Furrow, the Gleaner, and the Yearbook are all expressions of the student's real interest in his College, and his willingness to spend of his time and his energy in those things which contribute to the best interests of all of us. His unselfish dedication will return many dividends in the future, as he looks back upon an opportunity to serve which he did not let pass, and may even see the results of his service in these publications, which will live on forever in the archives of the Krauskopf Library.

February 5, 1964

## Our Thanks

It has come to our attention since the printing of the last *Gleaner* that in expressing our thanks to the various students and faculty members who helped make the *Gleaner* possible, we failed to mention the credit which was rightly due Dr. Joshua Feldstein.

In the past several years he has contributed a great deal of his time and efforts to the publication of the *Gleaner*. Because of the great demand on his time by other activities, he himself asked that he be replaced as faculty advisor to the *Gleaner*. Dr. Feldstein's many efforts were a major contribution toward the improvements which were made in the *Gleaner*.

With this we express our thanks to Dr. Feldstein and apologize for our failure to acknowledge his assistance.

## Help Wanted

With the publication of the December issue of the *Gleaner*, we demonstrated the quality of *Gleaner* we could produce with the proper support. This support came from the faculty, administration, and—most important—from you, the student body.

We can produce a *Gleaner* of which you as students of Delaware Valley College can be justly proud only if you give us the proper material to work with.

The *Gleaner* is sent to alumni, businessmen, and more importantly, to other colleges. To these people, the *Gleaner* reflects the character of our college and of the students who attend it. For this reason alone, we should strive to present a publication which proudly represents us outside the college.

It is our hope that every student during his four years at Delaware Valley will submit at least one article for publication in the *Gleaner*. We know that many interesting and worthwhile papers are written in the course of a college career which are of a quality suitable for publication but unfortunately they are cast aside without further reference to them. Material such as English assignments, lab reports, other class assignments, and of course material written solely for the *Gleaner* will help ur reach our goal of presenting a representative cross-section of campus activity.

The key factor which will allow us to continue to publish a magazine which will truly and honestly represent Delaware Valley College and of which you can be duly proud is continued and increased student interest and participation in the *Gleaner*. Without this support we cannot hope to attain our ambition of producing a top quality *Gleaner*.

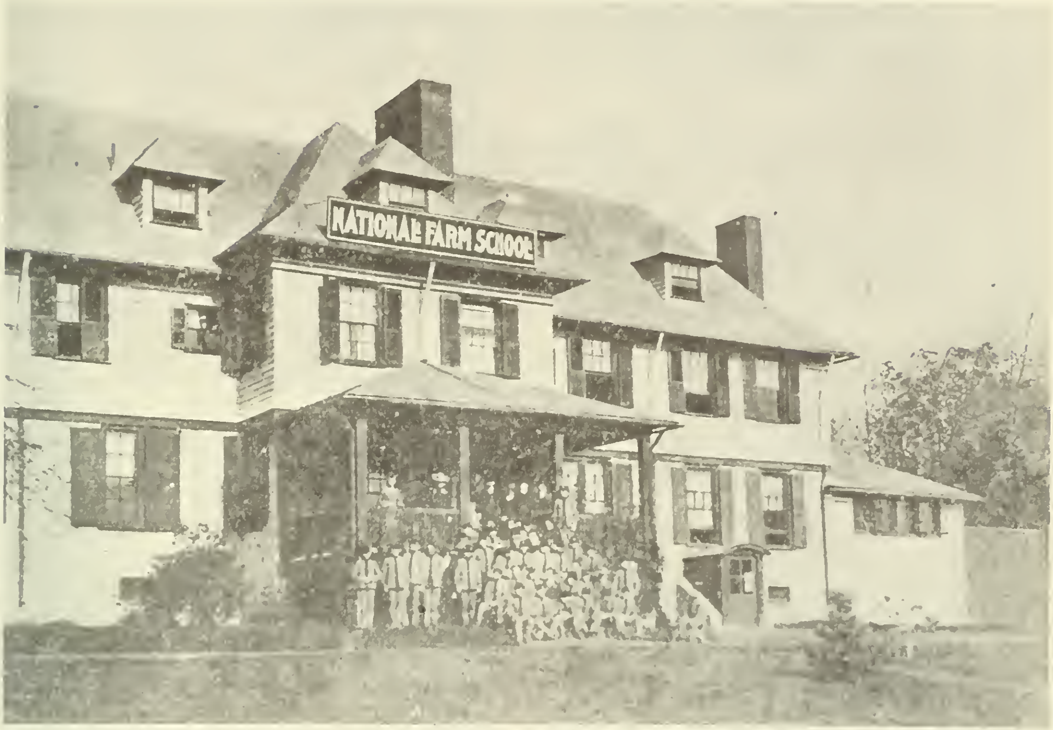
## D.V.C.-Temple Cooperation

The College announcement of the introduction, in the Spring semester of the Evening Division, of a course in education in cooperation with Temple University, is another broadening of the College's effort to serve the community. The offering of the education course itself is a helpful step. Launching the course in cooperation with Temple University is an effort to meet the need for such a course in this community more promptly than it might have been met otherwise.

One of the many favorable reactions to this move came from Dr. I. S. Ravdin, resident of Bucks County, President of the American Cancer Society, and Vice-President in charge of Medical Affairs, University of Pennsylvania. He wrote, 'You are to be congratulated in having carried forward to a successful conclusion the arrangement with Temple University. Such an arrangement will extend your educational opportunities." Dr. Ravdin is the recipient on an honorary degree of Doctor of Science from the College and is also an honorary Alumnus.

# *Pioneer Hall • 1897*

ROBERT HILSEN '64 WILLIAM STOCK '65



If one were to ask, "What was Pioneer Hall," many of us would not know. To the students of the Farm School in the early 1900's it was everything. It was not only Pioneer Hall but also the whole school. It contained the classrooms, library, dining hall, kitchen, laundry, gymnasium, dormitories, reception room, office and quarters for the Dean. Pioneer Hall represented the pulse, the very heart of the school in those early days.

From the proceeds of a second lecture tour, and $1,000 given to him by friends, Dr. Krauskopf raised the second $10,000 with which Pioneer Hall was erected. Pioneer Hall was dedicated Sunday, June 20, 1897. The farm with buildings, furniture and farm equipment, represented a cost of $30,000.

In April, 1923, a fire destroyed Pioneer Hall at a loss of $75,000 and the added expense and inconvenience of housing the students in temporary quarters. The consequences of this disaster are reflected in a letter from Dr. Krauskopf to Judge James Gay Gordon two months later. Judge Gordon, presiding at a dedication ceremony of memorial trees on the campus on June 3, 1923, read from this letter.

"It is my love for it," wrote Dr. Krauskopf, "that is responsible for my being now deprived of the pleasure of joining in this occasion. I had come to the Farm School at the end of March after convalescing from a very severe illness. While on the grounds, the fire that destroyed Pioneer Hall took place and it was hard for me to stand by and to have to see the first building that I had seen erected at the School thus completely razed. There was about it for me a sentiment and feeling that nothing could replace. It was our first building. I had traveled the length and breadth of the country, lecturing, to raise the money to put it up, and added to the money thus collected my own meagre savings. At that time, Pioneer Hall provided all the young institution's needs. There throbbed the Farm School's very life, and within its modest confines were dreamed the dreams of the future, and out from it went inspiration for expansion and growth. Ever fondly as it was thus held by me, to see it burned down affected me more than my state of convalescence could stand, and this coupled with a heavy cold which I contracted at the time, brought on a severe attack of illness, which is responsible for my absence today."

Those walls of Pioneer Hall left standing were razed, the stones salvaged, and carried to another site. The memories associated with Pioneer Hall are enshrined in the walls of Ulman Hall of which the salvaged stone is now a part.

The letter written by Dr. Krauskopf to Judge Gordon also marked an end. It was Dr. Krauskopf's last written work. He died ten days later, June 12, 1923.

# *LIVESTOCK JUDGING: Learning in an exciting way.*

*Student judging of livestock which is so much a part of agricultural pursuits has long been an activity at the College. In the symposium which follows, two student members of the judging teams and two faculty who serve as coaches of the student judging teams discuss the various aspects of judging. Darvin E. Boyd '64, high-scoring member of the Animal Husbandry judging team, and president of the Student Government, and James L. Harteis '65, high-scoring member of the Dairy Husbandry judging team, and president of the Class of '65, are the student authors. Dr. Tibor Pelle, Professor of Animal Husbandry, and Arthur Brown, Associate Professor of Dairy Husbandry, are the faculty authors.*

*Editor*

## DAIRY JUDGING: HOW AND WHY

James L. Harteis '65

To succeed in dairy farming today one must have a sound breeding program based on high standards of type and production. In order to be a competent breeder, one needs to have a thorough knowledge of desirable dairy cattle type. The breeder must be able to recognize the strength and weaknesses in his cattle and in doing so he will strive to make matings that will retain the strength and eliminate the weaknesses.

Good type is the combination of conformation characteristics which are associated with high production and longevity. Much time and effort are required to master the art of correctly analyzing the type of dairy cattle. Having a thorough understanding of desirable type is the major prerequisite of good, consistent judging.

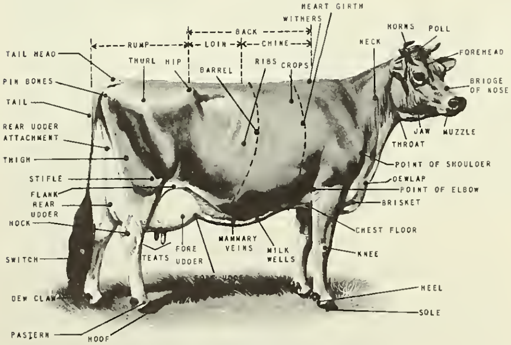


Figure 1

*Points to be judged on a Dairy Cow.*

The points indicated in Figure 1 are considered when one evaluates the type of dairy cow. These parts are placed in four groups and then considered as a group. These groupings are "Dairy Character," "General Appearance," "Body Capacity," and "Mammary System."

"Dairy Character" may be defined as the features which depict animation, angularity, general openness and freedom from excess flesh. The specific parts that are considered when evaluating "Dairy Character" are neck, withers, ribs, flank, thighs, and skin. The neck should be long, lean, and blend smoothly with the body. The withers should be sharp and well defined. The ribs should be long, wide, flat, and well sprung. Flanks that are deep, arched, and refined are desired as are flat, incurved thighs. The skin should be of medium thickness, loose, pliable, and have a fine coat of hair.

"General Appearance" is defined as attractive individuality expressing vigor and femininity in addition to harmonious blending and correlation of all parts with impressive style and carriage in a graceful walk. Head, shoulders, back, loin, rump, hips, thurls, pin, bones, tail, tail head, legs, and feet are observed when "General Appearance" is evaluated. The head should be clean, strong, alert, and have a broad muzzle with a strong jaw. The shoulders should be laid smoothly against the body. The back and loin should be strong, straight, and level. A rump that is long, broad, and level with a tail head that is neatly set between the pin bones is desired. The legs should be strong and straight with feet that have strong, springy pasterns, adequate depth of heel and level soles.

"Body capacity" refers to those parts of the cow which give her the capacity to handle the large quantity of feed necessary to produce large volumes of milk. The barrel and heart girth are considered when "Body Capacity" is evaluated. A barrel that is deep and wide is preferred. The ribs should be wide apart, well sprung and show sufficient depth to handle large quantities of roughage. The heart girth should be large, resulting from fullness at the point of the elbow.

The "Mammary System" refers to those parts directly related to the udder. These points are: udder, teats, veins, and attachments. The udder needs to be capacious, carried well about the hocks, and firmly attached in both the rear and fore udder. The teats should be uniform in size and shape and placed squarely and plumb. Veins which are large, tortuous, prominent, and branching with numerous large milk wells are desired.

The numerical value given to each of these categories is as follows:

| | |
|---|---|
| "Dairy Character" | 20 pts. |
| "General Appearance" | 30 pts. |
| "Body Capacity" | 20 pts. |
| "Mammary System" | 30 pts. |

The various breed associations have established classification programs in which each cow is given a score to indicate how she compares with the "Perfect" or "Ideal" cow which would score 100 points. The ranks in these programs are:

| | |
|---|---|
| "Excellent" | 90-100 |
| "Very Good" | 85-89 |
| "Good Plus" | 80-84 |
| "Good" | 75-79 |
| "Fair" | 70-74 |
| "Poor" | 69 and below |

Desirable type and high production are relatively inseparable, as are poor type and low production. The following table illustrates this point:

| *Rating* | *No. of Cows* | *No. of Years Milked* | *Milk lbs.* | *Fat lbs.* |
|---|---|---|---|---|
| Ex. | 700 | 3.5 | 11,387 | 566 |
| V.G. | 9,800 | 2.9 | 10,112 | 497 |
| G+ | 15,292 | 2.4 | 9,332 | 457 |
| Good | 7,002 | 2.1 | 8,595 | 421 |
| Fair | 1,346 | 1.9 | 7,981 | 388 |
| Poor | 39 | 1.7 | 7,565 | 368 |

Intercollegiate judging contests are designed to test the student's ability to rank cows for type. The contestants are given classes of four cows to rank according to type. They are then given an opportunity to defend their placing by delivering a set of oral reasons to an official. These reasons are scored according to accuracy, completeness, and manner of delivery. Each contest consists of from ten to fifteen classes and generally provides a fairly accurate account of one's ability to evaluate the type of dairy cattle.

There are two general methods used in placing animals within a class. The first method is to look for the qualities and strengths in animals and place the one with the most advantages first, at the top of the class, and the one with the least at the bottom. The other method is to evaluate the faults of the animals. They then can be placed with regard to the number of faults and the severity of those faults. Those with the least number of faults tend to go to the top of the class while those with the most faults go to the bottom. The actual placing is a weighing process, comparing the advantages against advantages and faults against faults.

Dairy cattle judging is a very important phase of the dairy business and all who are to succeed in any phase of dairying are going to need a basic understanding of desirable dairy cattle type.

## THE EDUCATIONAL ADVANTAGES OF LIVESTOCK JUDGING

ARTHUR BROWN
*Associate Professor of Dairy Husbandry*

Following is a list of the major educational functions, as I see them, of livestock judging courses and intercollegiate judging contents:

1. They instruct in the selection of animals of desirable type.
2. They enable students to meet and compare themselves with students of other colleges.
3. They serve as a means of getting acquainted with outstanding animals and livestock people.
4. By giving oral reasons on their placings, students receive practice in logically organizing their thoughts and giving them verbal expression.
5. Judging courses and contests offer just plain fun in an educational setting.

These educational functions appear to me ample justification for having judging contests in the curriculum. However, many educators do not agree. Livestock judging is considered by them a "vocational" type activity, lacking the rigorousness, the theoretical base, and, hence, the academic respectability of other courses in the agricultural curriculum. Furthermore, it is contended, knowing how to judge animals on the basis of conformation (type) has little or no utilitarian value because of the low correlation between type and production.

I do not wish to get involved here with the second objection, the low correlation of type and production, except to point out that this is a controversial subject and regardless of one's position on the matter, the conformation of animals, particularly registered ones, affects sales values. This is a consideration sufficiently utilitarian to overcome any objection on that score to the inclusion of judging instruction in the collegiate curriculum.

It is the first objection, the "vocational" character of the judging courses that I wish to consider here. This objection is often lodged, also, against other technical courses in the agricultural curriculum, especially production courses, such as Dairy Cattle Feeding and Management, Beef Production, and the like. The charge is made that such courses teach "sub-academic" skills and facts and that their subject matter is obsolescent—it will be out of date in a few years. These objections are often coupled with the argument that what agricultural students need is more "basic" education — more work in the "pure" sciences and in the humanities, etc.—as a foundation for the professional versatility and competence required in a changing and demanding field.

To the charge that the subject matter of judging and production courses is obsolescent, let me say this: This is true for all scientific or technological fields. It is true for medicine, engineering, pharmacy, and the others. Take, for instance, the "purest" of the sciences, physics. Knowledge in the field of physics is said to be doubling every six years. And surely its theoretical foundations are in a highly fluid state. Shall we throw physics out of the curriculum and do the same for technical courses in medicine, engineering, and pharmacy?

To the charge that judging and production courses in agriculture teach skills and facts that are sub-academic, I reply that so do chemistry and biology courses. If learning how to balance a feed ration is a sub-academic activity, so is quantitative analysis in chemistry. If learning how to weigh and evaluate the many elements involved in judging livestock is a sub-academic activity, so in memorizing the various varieties of micro-organisms in bacteriology.

The problem of production courses and judging is not that they deal with sub-academic or obsolescent subject matter. The problem is whether they perform their unique functions in an adequate manner. This is no less the problem with all courses of instruction. And, in the final analysis, the success which attends the performance of each course rests with the teacher.

I should like to add a final observation. If there is any one unassailable psychological truth regarding the educational process, it is this: Subjects which interest us, we attend to; those which don't, bore us. Livestock students come to college with an interest commitment to animal agriculture. So-called "vocational" courses vitalize their entire academic life. It is through their interest in such courses and the excitement that interest engenders that the whole curriculum, including the basic sciences and humanities, can be made truly meaningful.

# THE VALUE OF LIVESTOCK JUDGING

DR. TIBOR PELLE
*Professor of Animal Husbandry*

In every walk of life, personal experience with a situation creates helpful understanding. Livestock judging is one such activity which has a great deal of meaning for those who are familiar with it. It is difficult to put this meaning into words that will do justice to its importance as a means of teaching students specializing in agriculture to think.

There are very few phases of the livestock business where judging is not used. Whenever one buys or sells, decides what to retain as breeding stock, what to ship to market; or what animals to mate, there is judging. The farmer who buys feeder stock, or the livestock buyers representing the packing house, or the private butcher, will all have to be familiar with the traits they are looking for; they must exercise judgment when they buy. Every livestock breeder practices judging. All the big and famous herds of beef cattle or swine, and flocks of sheep, were developed by men who had extensive training in judging.

It is a well-known fact that the information one has about the ancestry, the pedigree, the past performance of the breeding animal, or in the case of an older one, the progeny already produced, is very important in selection. The practical question, however, is "How many times is this information available?" We still buy or select on an individual basis. Most of the buying or selection of meat-producing animals is based on visual observation alone of the type and quality.

The official judge in the show ring whose task is to select the animals and place them according to their individual merits is helping the breeders by choosing the more desirable type and quality of livestock. He is concerned solely with the individual animal.

How is judging important for the student? First, what is livestock judging? It is a thorough analysis of animals, and a comparison of them against a standard that is acknowledged as ideal for that particular stock. There are four main steps in judging:

1. INFORMATION: The student must have a good knowledge of the correct animal form and its present day characteristics. In the market classes, he must know what the present market requirements are; in the breeding classes, he must know what constitutes excellence in males and females of the various breeds in the different species. He must know all the different parts of the animals and the relationship between form and function.

2. OBSERVATION: This step requires a keen power of analysis and observation of the type, quality, and form of animals, and these observations must be complete and accurate. Only experience can teach the student to be competent in this area.

3. COMPARISON: To a student a group of animals may appear to be alike. But no two animals are exactly alike. (Identical twins are very rare in the livestock population.) He must compare the animals and the most important traits in which they differ. Sometimes it is very hard to compare and evaluate different traits in respect to their importance. This is of greater significance in the breeding animal than in a market animal. It would be easy if the comparison were confined to only one characteristic. But unfortunately there are many to be considered. Skillful comparison is one of the hardest steps in judging, and also the one which requires the most skill and sound judgment.

4. DECISION: This step is based on the previous three. The student has to make up his mind and reach a decision without delay. The development of these mental skills is a basic goal of teaching, and its achievement brings the greatest satisfaction. Making decisions is not limited to livestock judging, it is a part of everyday life. It is difficult to find a course where orderly thinking and prompt decisions can be taught as effectively as in livestock judging. One learns to distinguish between the more important items and the less important details. The judge's decision has to be sound and correct, because he has to satisfy the breeder, the seller, the buyer, and himself as well.

Learning to judge is more than learning how to place the animals correctly. An integral part of judging is backing up the decision by giving oral reasons. The importance of teaching this part cannot be emphasized enough. In college the training in giving oral reasons usually starts when the student is fairly familiar with the basic rules of judging. This part of the study is essential, mainly because anyone who pretends to be a livestock judge must have reasons for his decisions and the ability to explain them correctly.

A variety of terms and expressions are studied which enable one to talk the professional livestock man's language. A judge must be conversant with the appropriate vocabularly, must express himself in an impressive manner, and yet clearly so that any one concerned may understand.

The evaluation of oral reasons is quite different from that of placing. It is more personal. While the judge who scores the placing has to obey strict rules, the judge who listens to the reasons has a free hand in evaluating them.

What skills should a student be taught in order to give a good set of reasons orally?

1. He should know how to convince the listener that he is telling the truth; that he is unmistakably talking about the stock in question (no generalizations); and that he knows each animal in the class.

2. In comparing the animals, he should know how to stress the most important differences concerning the main parts or characteristics and to neglect unimportant details.

3. He should talk "livestock." He should be sure that his expressions are "stockmanlike" and that the terms he uses apply correctly to the respective parts or characters. He should learn to use a variety of terms without repetition. He should be skilled in making significant comparisons.

In what way does the student benefit from studying livestock judging?

It helps him in his career. There is a great demand for competent judges. Competent or potentially competent ones are in short supply. In all phases of the livestock industry, the knowledge of evaluating animals is essential. The meat industry is in need of people who have been trained in judging.

Livestock judging for the student is exciting and inspiring; it provides competition, not just a desire to make a good grade. It teaches honesty, it requires independent and individual thinking. It gives confidence to the shy, and humbles those who are cocky or conceited. A good judging course builds character, requires pleasing manners, and teaches the student discipline and respect for other people. It also improves the discipline of mind.

The student learns how to concentrate and how to develop his memory. When he gives his oral reasons four or five hours after he has placed them, he has to remember 32 or more animals, talk about them, and discuss them fully. He learns to express himself correctly and fluently.

To the student choosing for his major, animal, dairy, or poultry husbandry, the animal is his bread and butter. Without the animal, his work loses meaning. If he is not taught how to evaluate the animal, his knowledge is far from adequate.

Very often we hear comments that we do not test our students often enough. This statement certainly does not apply to livestock judging. Every time the class meets, the student is tested, and the test is not restricted to a certain area of the subject. The student is always confronted by everything he has studied.

What of the value of judging contests, intercollegiate or otherwise? The students who participate in judging contests travel, meet people from the industry, and make valuable contacts. These benefits should not be overlooked. It is a known fact that students who have been members of a judging team, let alone those who were on a winning team, hold the better positions.

There are rewards, too, for the instructor and coach. Strenuous as intercollegiate competitions are, no student has been known to say he regretted having been a participant. To take a group with little or no experience with livestock judging and in a comparatively short time watch them compete effectively against teams from larger colleges and universities is almost unbelievable but impressive. In the past few years, we had two students with small speech defects. Each time they stood before an audience, they had great difficulty to express themselves even in a few words. Through a great deal of practice, they became valuable members of our judging team.

When the student judges attend the Award Dinner at Chicago's Stockyard Inn—one of the highlights of the International Intercollegiate Livestock Judging Contest with all the prominent livestock people participating — there is ample proof of the significance of this activity. To watch the student's interest grow and develop carries its own special reward.

## EXPERIENCE AND VALUES THAT LAST

Darvin Boyd '64

Intercollegiate livestock judging is a sport that can be likened to basketball. Although livestock judging and basketball are similar in some ways, they are different in others, the main difference being a mental strain in judging whereas the major strain in basketball is physical. These two sports are also quite different in purpose. The major purpose of livestock judging is to learn how to select the best quality of livestock for market or breeding. The main purpose in basketball is to develop the physical coordination to shoot baskets. In both, the teams prepare and practice to give their best performance against their competitors in every contest.

The members of a basketball team learn their plays and how to work together as a team. The coach drills his team physically to get his players in top shape to play to the best of their abilities. The coach works with his team for a whole season. He scouts the opponents hoping to take advantage of their weak points. A basketball team can go to work every day in familiar surroundings. In just a few moments the players can be shooting at the same baskets from the same floor on which they practiced yesterday and will practice tomorrow.

At game time the gym is usually filled with faculty and students, full of team spirit, all rooting for their team. The coach selects the starting quintet; there is a roaring response to the naming of each player over the loudspeaker; the gun sounds and the game is on. A player can make a mistake and a teammate can correct it. The coach and the players can discuss the play as the contest goes on, either by talking during the game, calling "time out," or during half-time. When a team member plays poorly, he can be replaced. The score is shown throughout the game. The team can try a new formation, or put forth extra effort.

In the course of a basketball career, a player learns sportsmanship, to work as a team member, and to meet competition, and will gain prestige. What is the value of this, however, ten years after graduation?

What happens in livestock judging? The team members must also practice. The team, however, is handicapped in two ways; first, most of the members have not had any previous experience; and second, the coach is usually a full time professor and is not free to spend full time coaching. Team members must work twice as hard to learn the 'plays" and take advantage of the practice. The "plays" are quite different from basketball. Each one must be mastered by each member of the team who must perform by himself without help from his teammates or the coach.

Three species of livestock are usually judged — beef cattle, sheep, and swine. Unlike dairy judging, each species is different in size, appearance, purpose, and characteristics. A judge must master all the external parts of an animal. Because of the differences in purposes and characteristics of each species, the terminology varies greatly for the corresponding parts of each species. Each species has major breeds which vary in breed type and character.

In beef cattle judging, three breeds are judged: Angus, Hereford, and Shorthorns; six breeds in sheep—Cheviot, Dorset, Hampshire, Shropshire, Southdown, and Suffolks; eight breeds in swine—Berkshire, Chester White, Duroc Jersey, Hampshire, Landshire plus several crosses of these various breeds. Each breed is different in character and type, such as in the shape of the head or other parts. This, therefore, requires an extensive vocabulary of terms.

A judge must know all the male and female characteristics when he selects livestock for breeding purposes. His knowledge must be expanded when he judges cattle, swine, and sheep to be fed for market. The points to be evaluated in selecting market animals are quite different from those used for choosing breeding stock.

As a judge of livestock, what must a member of such a team know, practice, and master? Here are six important skills:

1. He must know the language and terminoloy of the livestock industry.
2. He must know what to look for in the different breeds of livestock. This requires a vivid mental picture of the "ideal," or the "best of characteristics."
3. He must know the significance of the important characteristics.
4. He must be able to "spot" and feel these characteristics accurately and quickly.
5. He must be honest and courageous in his observations, relying on his own judlgment.
6. He needs much experience to maintain a mental picture of the classes to substantiate his placings with sound reasons – clearly and with poise. This requires a cool head, a fund of knowledge, and great concentration.

These are the "plays" which the judge of livestock himself mut set-up and then execute. They are performed, not in a permanent area, but wherever livestock is available for judging.

This means the team must travel from place to place, away from the college to practice its "sport." The judge practices for a contest by judging *classes* of livestock. Each class consists of four animals. The four animals judged are always of the same species and purpose, and usually of the same breed, such as a class of Angus heifers in cattle, Suffolk breeding ewes in sheep, or Yorkshire market hogs. In practice, the coach will establish the "official placing" of the animals after comparing them with one another and with an imaginary ideal. If the student judge's placing is the same as the coach's the student will be given 50 points. As his placement deviates from the coach's "official placing" his score will be lower.

After the student has judged the class, he must give oral reasons to the coach, out of sight of the animals, as to why he placed them as he did. It is also possible to earn 50 points on "reasons." A poor performance on "reasons" will earn fewer points. It is possible, therefore, to receive 100 points in judging a class by analyzing and then explaining in about two minutes, accurately and completely, without notes, the reasons for a particular placing.

Intercollegiate livestock judging contests held each year in November in Chicago draw teams from all the top agriculture colleges in the country. Each college team entered competes against the best teams, and the top performers become well known among all who take part.

In these contests, the judges are the top men in their fields. They decide the "official placing" of the animals being judged; these are the men to whom the student contestants present their reasons, and who award the points. Twelve classes are judged—five in beef, four in swine, and three in sheep. Reasons must be given on eight specified classes so there is a possible score of 1000 points for the contest.

In the actual judging, the contestants are divided into groups and scheduled. Each group is given 15 minutes to judge a class. Several more minutes are allowed to pass from one class to another. This continues until the judging of all classes is completed.

Like the start of a basketball game, the day of judging also has its start. A few minutes before the official starting time, the coach selects his starting quintet. He shakes their hands and wishes them "Good luck." At 8:00 A.M., off goes the starting gun. There is no large crowd cheering for the team. The student judge doesn't need this to "get going" because the knowledge that he is gaining experience for his future occupation is sufficient to spur him on. The contestants do not have a scoreboard to follow; they cannot discuss the play with their teammates, or rely on them to cover missed opportunities; substitutions cannot be made; time-out cannot be called; there is no half-time for pep talks; the coach cannot talk to his team members. It is strictly a matter of self-reliance and ability on the part of each individual team member.

About noon, the actual placing of all classes is completed. All contestants eat lunch at the same place and are not allowed to discuss the classes. One has little appetite while trying to recall an image of the classes to be analyzed and lining up the pros and cons for the placing. After lunch, reasons are presented to the judges. This continues in a definite order until each contestant has given eight sets of reasons.

It is now about 6:00 P.M., and the contestants have just completed a nine-hour contest of physical and mental strain. After the final reasons have been given, the team members and the coach may discuss the team's placings. As the teams quietly leave the scene of the contest, there is no crowd cheering their performance.

The day's events do not have to be impressed upon them with cheers. What each one has accomplished is his for "keeps." The student judge, like the basketball player, meets competition, learns good sportsmanship, and gains some prestige. Much more important, he has learned to rely on himself. He has made personal contacts with students and professional people in the livestock field. These contacts can be valuable to him for the future. He has gained an insight into the livestock business, and, as an individual, has gained experience and knowledge which will be useful to him in his occupation through life.

| | | | | | | | | | | | | |
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Corrections:
Heiroglyphics
Oasis

# *Gateway to Latin America*

RICARDO VALDES '65

*Monument to Simon Bolivar in Bogata, Colombia*

Colombia lies in the far northwestern corner of South America, with Panama and the Atlantic Ocean on the north, Venezuela and Brazil to the east, Peru and Ecuador to the south, and the waters of the Pacific to the west.

With an area of 440,000 square miles, the country nearly equals the combined acreage of Arizona, New Mexico, Nevada, and California. About half of Colombia's territory in the eastern sector is made up of prairies and rain forests. This part of the country, dominated by tributaries of the Orinoco and Amazon Rivers, is sparely settled and varies widely in the climate. The northern portion has wet and dry seasons, while the rain forests are found to the south. It is in the western part of Colombia that the bulk of the country's economic life is found. Gigantic Andean mountain ranges dominate this highland region of rich valleys and plaeaus.

The north is the Atlantic or Caribbean coastal area with its flat, lowlying lands crossed by meandering waterways. Here are also the rugged Sierra Nevada de Santa Marta and beyond these the semi-arid Guajira peninsula.

There is another distinct sparsely populated region, the tropical rain rain forests of the Pacific Coast.

Colombia claims soverignty over the San Andres and Providencia Islands, located 440 miles northwest of the mainland, about 130 miles east of the coast of Nicaragua. The two islands have a combined population of more than 6,000. The San Andres and Providencia Islands have proven to be very popular with tourists.

In the highlands there are two distinguishable rainy seasons, and two dry seasons; they come at varying times depending particularly upon the altitude, but the periods from April through May and September through December are generally considered the wet seasons. In the Andean regions the temperatures varies with the altitude. Medellin at 4950 feet, has a mean annual temperature of 70.5 degrees. Bogota, at 8727 feet, has a mean temperature of 58.1 degrees.

Colombia took its name from Christopher Columbus who discovered this American Continent. Until 1492 Colombia was inhabited solely by Indian tribes, separated in many cases by vast mountains and impenetrable jungles.

There were two main groups of Indians: the Caribs, who gave their name to the Caribbean Sea, and the Andeans, to the south; the culture of the second, in particular, was very well advanced.

In this era of Spanish conquests some of the oldest cities in the Western Hemisphere were founded. Santa Marta, the oldest Colombian city, was founded early in the 16th century. Cartagena was founded in 1523, while Popayan, Calif., and Ibague were founded in the middle of the 16th century.

Spain ruled Colombia from the 16th until the beginning of the 19th century. There was continual pressure toward independence, with an outbreak of violence in 1781 when the province of Socorro, now known as the Department of Santander, rebelled against Spanish rule. Then on July 20, 1810, Bogota rose up in the rebellion that led to the declaration of Colombian Independence.

Cartagena declared its independence Nov. 11, 1811. Fighting began in earnest at this point with the tide of battle favoring first one side, then the other. Spanish forces re-took Bogota (the Colombian Capital) in 1816 but the battle of Boyaca, August 7, 1819, turned the tide.

Colombia became an independent republic under the leadership of the Liberator Simon Bolivar, with Francisco de Paula Santander serving as vice president. In the years that followed, the Colombian military force and monetary backing joined the struggle to bring independence to Ecuador, Venezuela, Peru, and Bolivia.

Until 1830, Colombia, and neighboring Venezuela and Ecuador, formed a single nation known as "Greater Colombia." A succession of civil wars in the 19th century reduced the nation to its present size and also gave rise to the two traditional political parties in Colombia, the Liberals and Conservatives.

The chief political and administrative characteristics of the Republic were eventually consolidated under the Constitution of 1886, later amended in 1910, 1936, and 1945.

After a military junta took over the control of the government from Gen. Gustavo Rojas Pinilla in 1957 the Liberal Party leader, Dr. Alberto Lleras Camargo, worked out arrangements for a 16-year political truce with Laureano Gomez, leader of the Conservatives.

These negotiations, which were documented in official constitutional reform, assure both parties of equal representatiion at every level of government for the next 16 years. Even the Presidency is slated to alternate betwen liberals and conservatives in this unique and successful solution to the problem of long standing political disagreements.

Colombia has been called "gateway to Latin America" because of its location in the northcentral sector of that vast and rich continent. It is an inviting gateway which welcomes the travelers to a fascinating variety of scenery, people and experiences.

This country reflects much of the variety found throughout all Latin America. The Equator slices through the southern sector of the country, but the climate, whether tropical, semitropical, or cold varies chiefly with the altitude.

# CAMPUS PHOTO CONTEST

# $30.00 IN CASH PRIZES!

## $10.00 FIRST PRIZE IN EACH CATEGORY

1. 35mm COLOR SLIDES
2. BLACK AND WHITE PRINTS
3. COLOR PRINTS

**Prizes will be awarded for the best photos depicting campus life and students at Delaware Valley College.**

### RULES

(1) Contest is open to all Delaware Valley College students.

(2) Pictures or slides must have been taken by the student entering them.

(3) A student may enter as many pictures or slides as he wishes.

(4) Pictures and slides must be submitted by April 15, 1964. They should be submitted to Ron Smith, Room 205, Barness Hall.

(5) Pictures or slides should include a member or members of the student body and/or a campus scene.

(6) Entries will be judged by local professional photographers.

(7) The name of the entrant must be printed on the back of the picture or slide in ink.

(8) Pictures and slides will be returned.

(9) Contestants agree that any picture entered in the contest may be reproduced or printed by the GLEANER.

# *Kehilan al Maisan*

William L. Kronen '65

In the annals of recorded history on the Arabian Horse, one story is told about a white mare that saved her master from a cruel and certain death.

On the march homeward after an extended battle with a neighboring enemy, the tribe of the Anazeh make camp in a sheltered spot on the ruthless Arabian desert.

The tents were unfolded and set up, while the horses were unsaddled, hobbled, and turned loose to forage for their night's feed. The white mare was joined by her young colt, who immediately started to nurse. After she finished nursing her young son, the mare did not follow her usual custom of joining the other horses, but instead climbed a slight knoll and faced the now disappearing trail over which the party had just traveled.

The mare was a statue of beauty, with flowing mane and tail. Her neck was arched, ears alertly forward, her soft eyes searched the back trail. This impressive sight, along with her strange actions, attracted the attention of the entire tribe.

The mare's owner insisted that she heard some far off sound, inaudible to the human ear. The other members of the war party scoffed at this ridiculous idea.

A test was performed attempting to distract the mare from her tireless vigil on the hill by placing grain in front of her. In the midst of eating, her head would snap up to an alert attention, her jaw would stop and her entire body would tense and remain a motionless silhouette against a reddening sky. Her hobbies were then removed, and attempts were made to chase her from the site. Each time she circled back to the hill, and assumed the same motionless attitude.

Sure that the mare was hearing the approach of what he thought to be a large party of warriors coming to take revenge on the tribe for their encounter of the early afternoon, the sheik collected his family and belongings, mounted his mare, and rode off into the fast-fading rays of sunlight. Through the night he was followed by the taunts of his fellow tribesmen who insisted that no one was following their trail of retreat.

That night a tribe of hostile warriors swept through the tent village of the Anazeh Bedouins. The battle was one of the worst massacres in the history of the Bedouins, with the white mare, her master, and his family the only ones to escape death.

Since that time all the descendants of that beautiful mare are named KEHILAN al MAISAN, or the Listening Horse.

# *Crossbreeding Beef*

**Robert J. Sabol '63**

*Introduction*

In this seminar I will attempt to bring out the different factors effecting most aspects of this field of crossing beef cattle. I will discuss the purpose, some genetic formulas, and feed conversion related to this topic of crossbreeding beef. I will also look into the future possibilities of this field.

*History*

Crossbreeding in the cattle industry, both beef and dairy, is quite old. The people centuries ago were unknowingly crosing animals. At the early stages of the animal industry—there was no such thing as a breed. It was a matter of breeding similar animals to similar animals. Down through the years it was slowly learned that certain animals bred to certain other animals produced a more desirable type of offspring. As for need and demand for certain types of animals were called for, the breeders or early farmers attempted to produce what the demand called for. Eventually we have produced a breed. Most of these early breeds had the main purpose of producing milk. It was not until recent years that the beef industry became one of importance. As we know the breeds were formed out of different types of animals. Eventually a breed tended to have uniform characteristics. Turning our attention to beef, we know that some characteristics for the Angus were the black color, polledness and ability to furnish a high quality carcass. On the other hand when we look at a Hereford we notice the difference in its color, horns (in some cases), larger size and a slightly poorer carcass quality than the Angus as shown in the results of a number of shows.

Even after these breeds were fairly well established we know that it was very often found that the breeders were still not satisfied with the production of their animals. They then turned to new ways and methods of improving these animals so that these animals will give them more and faster profits. To obtain their objectives they knew they had to raise animals which would make faster gains and put on more meat then the animals they already had. One solution might be the crossing of the different existing breeds. This is known as crossbreeding.

At the present time we have three major breeds of beef cattle: Aberdeen-Angus, Shorthorn, and Hereford. It is mainly with these three breeds and the Brahman in which we see our cattle breeders working in order to arrive at improvements in establishing both a new breed or the producing of a first generation offspring of crosses which would be superior to both parents in respect to reaching an early market weight and to being a higher quality animal.

*Breeds of Today Formed out of Crosses*

There are several breeds which were recently developed, which had originated from crosses and are the most common breeds of this type. The Santa Gertrudis has been developed from the Shorthorn and Brahman breeds. The Santa Gertrudis of today carries approximately five-eights Shorthorn blood and three-eights Brahman blood.

The Brangus breed is one of an Angus and Brahman cross which is quite popular. The ratio is three-eights Brahman and five-eights Angus.

Another recently developed breed is the Beefmaster. It is approximately one-half Brahman and the other half made up equally of Shorthorn and Hereford.

*Heredity Involved in Crossbreeding*

We know that when we work with any type of mating we are working with genes. In producing an offspring we are attempting to get a concentration of good genes for the characteristic or characteristics we are striving for. In crossing, when and if we would produce this offspring, we are particularly interested in getting the egenes for this characteristic to be in a homozygous condition in order for the animal to be able to transmit this characteristic to future generations.

As an example, let us take two animals. One animal would be from one breed which has a good quality carcass and the other animal noted for its faster rate of gains. In crossbreeding we are attempting to produce an offspring which would have both these characteristics. Let us set this up in a chart using genetic symbols. We shall assume that both animals are homozygous for this characteristic.

M = higher quality meat
m = poorer or lower quality meat
R = fats rate of gain
r = slower rate of gain

MMrr X mmRR
f1 MmRr

We can now see that by crossing the two animals we get an offspring which theoretically will be better than the parents as a result of the cross because it has both of these two good characteristics of which each parent had only one. I said "theoretically" because although the animal has the genetic requirements it still has to have the enviromentnal factor available in order to make use of its potential.

Now that we have basically seen what we are striving for in the crossing of breeds let us go into this a little deeper. From above we saw how we are able to get a good or potentially good first generation animal. Now let us suppose that we want to go further and get a whole new breed which will show both these characteristics. This proves to be a very expensive and time-consuming operation for the average individual. As we see in the following chart there are a great number of different possibilties at which we may arrive.

f1 MmRr X MmRr

Gametes MR Mr mR mr MR Mr mR mr

| f2 | MR | Mr | mR | mr |
|---|---|---|---|---|
| MR | MMRR | MMRr | MmRR | MmRr |
| Mr | MMRr | MMrr | MmRr | Mmrr |
| mR | MmRR | MmRr | mmRR | mmRr |
| mr | MmRr | Mmrr | mmRr | mmrr |

From the above simple genetic chart we see that nine of the offspring, in the f2 generation, out of sixteen would repeat these characteristics of the parents, six of the others will be similar to one of the original parents and one out of the sixteen will be poorer than both original parents.

The main problem which arises when forming a new breed is to get homozygosity in the offspring. In the above example we are attempting to get an animal with the genotype of MMRR. We want to get both a male and a female of this type. One can easily see the time and problems involved in this experiment because the only method of detection is by mass trial and error or mass selection. If we are attempting to fix more than the two characteristics shown above the problems involved in fixing these charactertics become more complex.

### *Crossbreding Versus Straight Breed Breeding*

Now that we know a little about the genetical makeup of crossbreeds, let us look more into the practical value of it. The main question which arises when we talk about crossbreeds is whether or not is it worth the trouble involved. Since crossbreeding is a fairly common practice, especially in the southwest, we can see where a great deal of research would be done on a problem of this type. A great number of research papers exist where we find such questions as the rate of gain, feed conversion and size answered in the comparison of crossbred animals with purebred animals.

One such experiment we find was run on all three major breeds of beef, those being Angus, Hereford and Shorthorn cattle. This experiment was designed to compare purebred, two-breed crosses, three-breed crosses and backcross calves.

| | | | | |
|---|---|---|---|---|
| Number of matings | 116 | 117 | 113 | 117 |
| Calves weaned | 85 | 102 | 59 | 105 |
| Weaning wt. lbs. | 382 | 394 | 416 | 395 |
| Steer slaughter wt. | 1055 | 1105 | 1121 | 1069 |
| Heifer slaughter wt. | 743 | 760 | 802 | 784 |
| Steer carcass wt. | 630 | 662 | 676 | 642 |
| Heifer carcass wt. | 440 | 453 | 475 | 464 |

In the preceding article it was also pointed out that according to the U.S.D.A. carcass grades, no showed difference was indicted by any of the four groups.

Another interesting experiment is a comparison of the different breeds. In this experiment we will compare the slaughter weight of both purebred and crossbred cattle.

| *Breeds Used* | *Numbers* | *Weights lbs.* |
|---|---|---|
| A x A | 10 | 698.4 |
| A x H | 11 | 669.4 |
| B x A | 11 | 797.0 |
| H x A | 11 | 741.3 |
| H x B | 13 | 802.7 |
| H x H | 11 | 750.3 |
| S x A | 16 | 712.7 |
| S x H | 12 | 729.4 |

Abbreviations: A = Angus
B = Brahman
H = Hereford
S = Shorthorn
(The sire is presented first)

Another example we can look at is that between a purebred Brahman and Shorthorn-Brahman cross. Although the Brahman is not very popular in this area, we can see by the results of this test how the carcass value increases when the offspring is a combination of both parents. The only fault of this experiment is that it does not show the results of a purebred Shorthorn.

| *Item* | *Group* | | | |
|---|---|---|---|---|
| Breed | ¾ S<br>¼ B | ½ S<br>½ B | ¼ S<br>¾ B | Pure<br>Brahman |
| Number of steers | 15 | 16 | 16 | 16 |
| Slaughter wt. lbs. | 772 | 775 | 785 | 752 |

Another experiment compares feed conversion between Brahman and Shorthorn and Brahman-Shorthorn crosses.

| *Item* | *Shorthorn* | *Crossbred* | *Brahman* |
|---|---|---|---|
| Daily Gain | 1.37 | 1.59 | 1.50 |
| Feed Intake / 100 lbs. body weight | 2.24 | 2.19 | 2.08 |
| Feed required / lb. live weight gain | 6.95 | 6.44 | 6.56 |
| Carcass Grade | High Good | Good | High Standard |

From the several above experiments of the comparison of crossbreds and purebred cattle, we can get some idea of the work done in this field and what practical use it might be to the breeder. We must remember that not all experiments show the complete results or the complete operations involved. We must remember that test animals are living under ideal conditions and that the environmental factors are very important and the slightest change in environment can cause great changes in the results obtained.

### *Future of Crossbreeding*

We now know what we can expect both in gene combination and production in crossbreeding beef cattle. We know how to obtain the genes which would make it possible to produce animals which meet this quality we are seeking. As of today we know that crossbreeding is not often practiced in the United States. Most crossbreeding is done in the midwest and southwestern United States. We wonder if this trend will become more of a practice or will it become less popular in the future. By the indication of the examples given in this seminar we can see that the experiments proved that crossbreeding is a practice which has a great future. If the breeders are able to develop strains and breeds, such as the Santa Gertudis, Brangus, and Beefmaster, and are able to maintain a quality which is superior to the British breeds, we can see that this practice will be here to stay. In the future years we might get an indication of their improvement if we see crossbred animals finishing high in carcass contests and in all contests where these animals are judged for their meat quality because, in the beef industry, it is the killed or slaughtered animal which determines whether or not breeding has paid off.

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# *The $1,000 Joyride*

T. J. S.

If you have been in Nevada in the last year, or expect to be out there in the near future, you may be of great assistance to me. You see, I'm looking for a 1947 or 1948 red Chevrolet convertible with Nevada license plates. The only clue that I have is that this automobile's first license plate numeral was a two in 1961. Now don't get the wrong idea, I'm not interested in buying the car, but just to find out what the second numeral was. Believe me, I have full control of my senses; I'm just a curious individual.

Please let me explain this incident that occurred close to three years ago in Nevada. I was working near Reno as an executive for the Brooks Oil Company, making better than just a comfortable salary. Within three years I had made a good reputation for myself, and gained membership to an exclusive club. At the time, I wasn't married, and the club seemed like the perfect place for socializing, except for one thing. The fact was that the members were from the very well-to-do set, and this gave me an inferiority complex. It was by no means the money aspect that made me feel inferior. It was a certain air of phony sophistication that was choking me like a hangman's noose.

As time went on, I met a Larry Johnson at the club, and he struck me as the type of guy who was different from all the rest. I was right, in more ways than one. He wasn't a snob as the rest of the members were, and that made him 100% in my book. After quite a lengthy conversation, I found that we had many common interests. The one fact that impressed me was that Larry was willing to gamble on anything, the same as I was. This is the reason for the whole incident.

One afternoon at the club, I was sitting there putting on a front the same as everyone else, when in walks Larry. He sat down at a table, and I excused myself from the conversation and went to sit down at the same table with him. He told me that he just won $250 on a bet. I inquired, "How did you do it?" He replied, "It's a simple game that can be worth a fortune." With those few words, my eyes lit up like 300 watt bulbs, and I leaned over to get the full story. Larry explained, "You ride along the highway, and as the cars come toward you, you look at the license plate, and add up the first two numerals on the plate. The person who reaches 25, or the one closest to 25 points without going over wins the bet." I said, "It sounds interesting, let's give it a try." When Larry mentioned a thousand dollars as the bet, I must have turned a vivid green color, but I was still game.

We went outside and took my sports car, and headed for a starting point. After we arrived at an open stretch of a two-lane road, Larry said, "Let's start here, I'll go first." As we rode along, I saw a huge gray Cadillac come into view, and the first two numbers on the plate were 53. By adding these two together, Larry had a total of 8. As we traveled, I must admit that I was more and more intrigued by the whole game. Soon, another car came into view, and this time it was a 1957 or '58 Plymouth. The first two numbers were 79, for a total of 16. Larry added this to his original total and had a 24. He said, "That's close enough for me, now let's see what you can do." The next car was a 1961 Oldsmobile with California plates, and it contributed ten points to my score. We rode along for a while, and it seemed like an eternity between cars. There was no doubt about it, there was a definite nervous tension that was building up in the car. I hadn't noticed it before, but the muffler sounded loud, and at this point it was very irritating. I gave the car a little more gas, with the hopes of approaching the next car in the next dip in the road. Finally, a 1959 Ford came toward us, and the first two numbers were 63. This gave me a 9, and added to my first total, I had 19 points. The static mounted to even greater limits in the car, because we knew that the next license plate would probably end this torture. By this time, I couldn't wait to see the next plate, so I stepped up the pace a little more until we were doing over 80 m.p.h. Next, came this red Chevrolet that I mentioned earlier. I found myself racing toward it, paying no attention to the cigarette that fell from my lips. The front plate began to come into view, but just then, my right front tire blew, and I saw a shallow ravine as we spun off the road. The only thing that I can remember is that my head struck the steering wheel, and then everything blacked out.

As I lay in the hospital for two weeks, I could still see the number 2 as being the first number on the plate of that Chevrolet. But, what was the second number? Was it the "4" that I needed? When I was released from the hospital, Larry had left town, and I was neither $1,000 richer nor poorer. I searched the territory for two months and found neither Larry nor the red convertibe.

I moved back east to another location of the Brooks Oil Company, but I'll spend the rest of my life wondering what that second numeral was. As I have previously stated, I am a curious individual.

## THE DOG AND THE WOLF

A gaunt Wolf was almost dead with hunger when he happened to meet a House-dog who was passing by. "Ah, Cousin," said the Dog, "I knew how it would be; your irregular life will soon be the ruin of you. Why do you not work steadily as I do, and get your food regularly given to you?"

"I would have no objection," said the Wolf, "if I could only get a place."

"I will easily arrange that for you," said the Dog; "come with me to my master and you shall share my work."

So the Wolf and the Dog went towards the town together. On the way there the Wolf noticed that the hair on a certain part of the Dog's neck was very much worn away, so he asked him how that had come about.

"Oh, it is nothing," said the Dog. "That is only the place where the collar is put on at night to keep me chained up; it chafes a bit, but one soon gets used to it."

"Is that all?" said the Wolf. "Then good-bye to you, Master Dog."

*"Better starve free than be a fat slave."*

From AESOP'S FABLES

# A Study of Breeding Efficiency and The Factors Related to It at Delaware Valley College Dairy

David T. Ainsworth '60

## Summary

The object of any livestock breeder is to produce a pregnancy with each service. One hundred percent efficiency of reproduction in dairy cattle on a practical basis is all but impossible. There are many factors such as disease, injury, malfunctions of the reproductive organs, condition, and variation of the estrus cycle, only to mention a few, which tend to reduce the percentage of breeding efficiency.

Two services per conception or below is considered good breeding efficiency and herds with rates higher than this exhibit some measure of breeding trouble.

The average breeding efficiency of the Delaware Valley College herd was found to be 2.11 services per conception. The principle reason for this high figure is that we have several cows which prove to be difficult breeders. The average breeding efficiency of the bulls, both natural and artificial service, was found to be 2.17. The principle reason for this high figure is the poor results we have had thus far from artificial service. In comparing natural with artificial service, I found we are getting better results from natural service than we are from artificial service, a result which does not correlate with studies conducted in other herds.

The result of this study is that Delaware Valley College must place more emphasis on the breeding efficiency phase of their dairy program.

## Review of Literature

Many good reviews have been written in connection with breeding efficiency in dairy cattle. There are various ways of expressing breeding efficiency but I feel that the number of services required per conception is the simplest and most easily understood.

J. L. Lush[3] stated in his text on animal breeding that dairy cattle require between 1.8 and 2.5 services per conception in herds not complicated with contagious abortion. S. A. Asdell reported in his text, *Cattle Fertility and Sterility*, that in New York state experiments, it was found that cows which conceive require an average of 1.85 services per conception and that 10% of all cows will experience some sort of breeding difficulty at any one time. Fitch, Boyd, and Deley[11] found that approximately 1.7 services per conception were required in a brucellosis free herd of cattle. Workers at the Nebraska Station[16] found that under their conditions, the number of services per conception for dairy cows was 2.0 when all cows on test were considered.

From the preceding information, it is safe to conclude that approximately 1.7 to 2.5 services per conception could be considered normal for dairy cattle. However, it should be pointed out that if the number of services per conception is above 2.0, some measure of breeding difficulty is present in the herd.

What is an efficient cow? Chapman and Casida[7] reported that "an efficient dairy brood cow is one which produces her first normal living calf at a certain optimum age and another every 12 to 13 months for a number of years thereafter. In order to meet this standard of reproductive efficiency, a cow must conceive as a heifer at an early enough age to utilize efficiently her full reproductive and productive powers throughout life, and succeeding conceptions must be within 85 to 115 days following calving if the next parturition is to occur within 365 to 400 days following a normal gestation period."

There are many factors which can influence breeding efficiency in a dairy animal. J. W. Bailey[6] reports that perhaps the biggest single reason for the failure of an animal to come into heat, thus making conception and high reproductive efficiency impossible, is the fact that many dairy animals are simply underfed. H. A. Herman[12] reported similar findings and he stated that "a cow in a declining condition is less fertile and the reproductive cycle is slowed up. This is true even though no actual known nutrient deficiency, except total energy intake, might be suspected." Low total energy intake is the result of continued feeding of low quality roughage with inadequate concentrate ingestion. A second important factor which influences lowered breeding efficiency is malfunction of the reproductive organs. The two most common disturbances of the reproductive organs are persistent yellowbodies and cystic ovaries. A. B. Chapman and L. E. Casida[7] found experimentally that the average number of days for the reoccurrence of estrus after parturition is 69 in normal calving cases but in cases of cystic ovaries or retained yellowbody the average number of days was 71. Although this difference is not statistically significant, it must be remembered that this is an average and that it will influence reproductive efficiency because although the abnormal animals return into heat at 71 days, in many cases, conception will not occur with first service.

Age of the animal also affects breeding efficiency.

**Table 1—The Average Number of Services per Conception for 2,176 Cows Havings from 1-16 Consecutive Gestations.**

| *Gestation Period No.* | *Number of Gestations Used in Determining Average* | *Average Number of Services Per Conception* |
|---|---|---|
| 1 | 2,119 | 2.76 |
| 2 | 1,371 | 2.62 |
| 3 | 1,012 | 2.26 |
| 4 | 805 | 2.31 |
| 5 | 628 | 2.57 |
| 6 | 491 | 2.54 |
| 7 | 360 | 2.73 |
| 8 | 263 | 3.02 |
| 9 | 188 | 3.19 |
| 10 | 117 | 3.02 |
| Over 10 | 144 | 3.74 |
| Total | 7,498 | 2.63 |

Table 1 shows the average number of services required per conception for a large group of cows whose breeding records were examined by Ehlers and others[8] at the State College of Washington. Records were studied for a total of 2,176 cows having from 1-16 consecutive gestations. A total of 7,498 gestations and 19,714 services were represented. Although I feel that the average number of services required per conception for the various gestation periods in this study were high, it does show the differences in the number of services per conception for these groups. As can be seen, a cow seems to be most efficient, reproductively, at her third gestation.

Inheritance is also an important factor in breeding efficiency. According to Henderson and Reaves[2], workers at the Lousiana Station reported on some cow families that varied from 40.6 to 92.3 per cent in breeding efficiency with an average of 63.3 per cent, basing their percentage on one service per conception as 100 per cent. The West Virginia Station in studying nineteen families of Ayrshire cows, found that these families varied from 77 to 89 per cent in reproductive efficiency. These nineteen families varied also in the number of services per conception from 1.6 to 3.1.

There seems little doubt that reproduction efficiency is an inherited character.

The preceding are only a few of the many factors which can influence breeding efficiency.

### Review of Literature Pertaining to Variations in Estrus Cycle Length

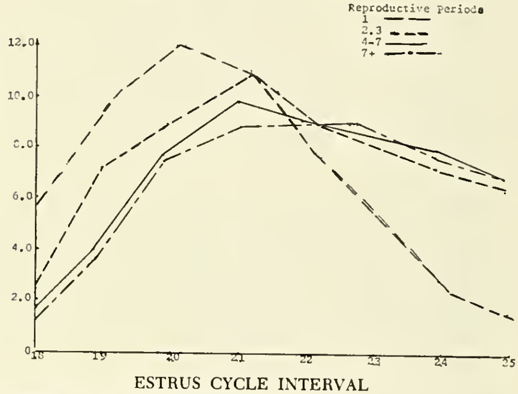
According to R. C. Erb, et al.[10] "dairy cattle show signs of estrus most frequently at 21 day intervals. However, like any other biological phenomenon, intervals vary. Less than 15% recur at 21 day intervals and generally less than 75% recur at intervals of 18 to 25 days. Because of delays in conception for the next production period, irregular estrus is a major problem." Chapman and Casida[7] reported that 40% of 690 cows showed estrus cycles less than or greater than 17 to 24 days. Asdell et al.[5] reported that 16% of 167 cows showed estrus cycles less than or greater than 18 to 24 days. Ellenberger and Lohmann[9] reported that 30% of 274 cycles observed were greater or less than 17 to 25 days.

These workers showed that 8% of the cycles were less than 17 to 25 days and 22% were greater than the 17 to 25 day length.

Olds and Seath[13] reported that there was significantly greater variation in cycle length between cows than there was within cows.

There are various causes of variation in cycle length. In a study of records of estrus cycle by Casida and Chapman[7], it was found that 7% of the cycles showed the occurrence of cystic ovaries which is one of the major causes of cycle variations within cows. Trimberger[15] found that of 400 cows used in his study, 15% of those treated for cystic ovaries became sterile and those which had been treated but remained fertile required 3.12 services per conception which naturally had a devastating effect on the average breeding efficiency for the herd. Casida et al.[7] found similar results and reported the low conception rate of 38% from one service after treatment for cystic ovaries.

Age of the animal also has some effect on the length of the estrus cycle. R. E. Erb et al.[10] found the modal length of estrus to be 21 days for cows and 20 days for virgin heifers. Chart I, taken from Washington Agricultural Experiment Extension Bulletin 583 by R. E. Erb, M. H. Ehlers, and R. A. Morrison, shows the variations in cycle length for the various age groups. S. A. Asdell et al.[5] reported that as the animal grows older the cycle length increased slightly but that they could not determine whether this was due to age or the fact that the animals have had young.



Influence of age on modal length of estrous cycles.
Erb, R. E., M. H. Ehlers, and R. A. Morrison; Environmental Influences on Frequency of Estrous Cycles; Wash. Agr. Expt. Ext. Bul. 583.

Sickness also is a major cause of estrus cycle variations within cows. When an animal becomes sick, it naturally gets in a weakened condition which tends to disturb reproductive functioning which will in turn cause a lowering of breeding efficiency.

As stated before, H. A. Herman[12] reported that when an animal is underfed and in a declining condition it is less fertile and the reproductive cycle is slowed up.

Some workers seem to think that the season of the year has an influence on the length of the estrus cycle but for the most part this has been disproved. S. A. Asdell et al.[5] reported that although Hammond stated that the interval between heats varies with the seasons of the year, being 40 hours longer in mid-summer than in mid-winter, his studies showed no conclusions supporting Hammond's statement. In accordance with this, Asdell stated that there was no variation in cycle length due to season.

S. A. Asdell reported in his book, *Cattle Fertility and Sterility*, that a cow tends to repeat her own pattern; if she has an interval shorter than the average, she tends to repeat it with each heat period, and the same holds true for longer heat periods. This fact accounts for much variation between cows.

Poor management can have a strong effect on cycle variations. If a heat passes unobserved either because it was short or silent, it will appear that the cow has a longer than average estrus cycle which, of course, she has not. This fact accounts for many of the 40 to 50 day cycles recorded in breeding records.

In conclusion it should be said that farmers should continue to breed cows with long cycles. Trimberger[15] reported from his study that results on breeding efficiency indicated that the chances for conception in cows returning in heat at irregular intervals are not decreased except for cows with short intervals and cows with cystic ovaries.

### Experimental Procedure

This study was conducted to determine the breeding efficiency of the dairy cows in the Delaware Valley College herd as well as the breeding efficiency of the bulls being used in the same herd. The breeding efficiency was determined in terms of services per conception as accurately as possible from the records of 64 cows and 15 bulls. Three of the bulls were used in natural service and 12 were used by artificial means. All 15 of the bulls were used in determining the breeding efficiency of the cows whereas breeding efficiencies were determined for only 11 bulls because the remaining four were used only once or twice.

The results for the cows and the bulls were then compared with publicized results of other herds. Natural and artificial services were compared and the results analyzed in a similar manner. Since the Delaware Valley College uses artificial service from two artificial breeding organizations, the breeding efficiency of the bulls from these two organizations were compared to determine from which organization we are attaining the best results. In this last comparison, only bulls in constant use were compared.

### Results and Discussion

The accompanying chart gives the breeding efficiency of the individual cows in the Delaware Valley College herd as well as the breeding efficiency of the bulls being used in the herd.

The overall breeding efficiency for the cows is 2.11 which is a relatively high figure but when all factors are considered, not too high. In arriving at this figure all cows in the herd were considered. If problem cows, such as cows number 5, 32, 59, 48-6, 52-6, and 52-8 are omitted, the figure is considerably lower, 1.74. The cows omitted in determining this second figure are those which have exhibited considerable breeding difficulty. However, they are members of the herd and for this reason, I feel that they should be included in determining the breeding efficiency of the entire herd. The overall figure of 2.11 is actually not too poor when one considers that, as stated in Henderson and Reaves[2], any figure below 2.0 can be considered good breeding efficiency. S. A. Asdell[1] states in his text, *Cattle Fertility and Sterility,* that cows require an average of 1.85 services to conceive and if the herd average falls short of these standards, that herd is regarded as a problem herd and in need of general investigation. Using the above figure as a standard, our herd does exhibit some measure of breeding difficulty.

There are many factors which are associated with a poor herd efficiency. Most influential are the animals which are difficult to breed because of inherited characteristics, malfunctions of the reproductive organs, or any of the other factors mentioned in my review of literature. Another very influential factor is management. The most serious managerial error is failure to detect heat periods. Often this cannot be avoided because of exceptionally short heat periods or because of quiet heat periods but usually it is neglect on the part of the manager. Trimberger[15] calculated the average duration of heat to be 15.3 hours for heifers and 17.8 hours for cows. He also found the range for heifers to be 4 to 25 hours and the range for cows to be 2½ to 28 hours. Eighty-three per cent of heifers have heat periods within the range 10 to 28.1 hours, while 93 percent of cows fall within the range 13 to 27 hours. According to Trimberger, only 7% of cows have heat periods longer than or shorter than the 10 to 21 hours range. Although most of these 7% have periods longer than 21 hours and are not hard to detect, there is still that small percentage which fall short of 10 hours. These are the cows which present the problem and the ones which require an alert manager if they are to be detected. Heat periods are known to be as short as 2-4 hours although this is not at all common.

The overall breeding efficiency of the bulls being used in the Delaware Valley College herd is 2.17. Only the 11 bulls used regularly were considered in this calculation. Again this average is rather high but this is due primarily to the fact that we have been getting rather poor results from the artificial stud services which we use. The age of the semen and the positioning of the same can have some effect but to the best of my knowledge both of these factors have been executed correctly and therefore can be disregarded.

The overall breeding efficiency of the 3 bulls being used in natural service is 1.86 which I would consider good. The breeding efficiency for the eight bulls being used regularly in artificial service is 2.66. These figures show that at the Delaware Valley College dairy we have attained far better results from natural service than we have from artificial service. These figures do not correlate with the results gained through a study at the Nebraska Research Station[15]. Workers there comparing natural and artificial service found that natural service required 1.80 services per conception whereas artificial service required 1.63 services per conception. In the Carnation Farms herd[4], services per conception have been reduced about 20% since the incorporation of artificial service into their breeding program. The reason for our unconventional results is the poor results we have attained through the employment of semen from the Curtis Candy Stud Service in the last two years. I do not mean this as a personal reflection on that organization, but I feel rather that our poor results were due to fate. Many of the services used from Curtis Candy were used on proven problem cows, those previously mentioned. We attained somewhat better results from the Lehigh Valley Breeder's Cooperative, but still these results do not compare favorably with the results of the Nebraska Station and Carnation Farms.

A comparison of these two stud services would be pertinent at this point. In determining the following results, only records of those bulls in standard use were considered. This was done so that a more accurate comparison could be made. Those bulls whose semen was used only once or twice were eliminated because one or two services can present very little conclusive evidence. The overall breeding efficiency of Curtis Candy service in our herd was 3.15 whereas that of Lehigh Valley was 2.36. This comparison is actually not very conclusive due to the fact that Lehigh Valley semen was used more times than that of Curtis Candy and as previously mentioned, Curtis Candy was used in more cases on problem cows. Both of these averages are very high in comparison to results in other studies.

Again there are many factors which can be associated with these poor averages. In addition to factors which have been mentioned previously, the time of service has a considerable effect on the conception rate. This would be particularly pertinent with artificial insemination due to the fact that the technician cannot always make the service at the most desirable time during the heat period. Table 2 by Trimberger and Davis, 1943[16], gives the relationship of time of service to the number of cows which conceive from one service. As can be seen, highest conception rates are atatined when the cow is bred at the middle of heat which precedes the time of ovulation.

**Table 2—Breeding Results in Females Bred Experimentally at Various Stages of Estrus and in Females Bred Artificially.**

| *Time of Service* | *Number of cows bred* | *Cows conceiving from one service* | |
|---|---|---|---|
| | | *No.* | *%* |
| Start of estrus | 25 | 11 | 44.00 |
| Middle of estrus | 40 | 33 | 82.50 |
| Bred at middle of estrus and bred in 24 hours | 25 | 21 | 84.00 |
| End of estrus | 40 | 30 | 75.00 |
| Artificial routine breeding | 194 | 123 | 63.40 |
| 6 hours after estrus ended | 40 | 25 | 62.50 |
| 12 hours after estrus ended | 25 | 8 | 32.00 |
| 18 hours after estrus ended | 25 | 7 | 28.00 |
| 24 hours after estrus ended | 25 | 3 | 12.00 |
| 36 hours after estrus ended | 25 | 2 | 8.00 |
| 48 hours after estrus ended | 25 | 0 | 0.00 |

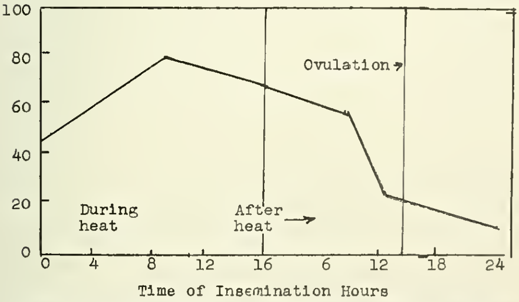


Figure 2—Relationship between time of insemination and breeding efficiency in dairy cattle. (Adapted from the data of Trimberger and Davis [1943], Nebr. Agr. Expt. Sta. Res. Bul. 129.)

Figure 2[15] gives the relationship between time of insemination and breeding efficiency in dairy cattle. The highest percentages of breeding efficiency are attained when the animal is bred at the middle of heat and lower percentages are attained if the breeding is prior to heat or after heat. Another factor which has some bearing on the conception rate of animals bred artificially is the site of insemination. A study by T. E. Patrick and H. A. Herman[12] resulted in the following percentages of non-returns for the various sites of insemination: combination cervix and body of uterus, 66%; middle of cervix, 66%; body of uterus, 68%; horns of uterus, 67%. Today, most technicians deposit the semen at the entrance to the cervix which, although I have no proof, would seem to give a lower percentage of non-returns. Although these figures are not statistically significant, they could very well account for some measure of decreased breeding efficiency.

In conclusion of this comparison of artificial service, I feel that the primary reason for our poor artificial results is the fact that many of these services were to cows with known breeding difficulties.

In the other phase of this study, i.e., variations in estrus cycles, it was found that most of the variation in the Delaware Valley College herd was between cows and not within cows. As previously mentioned, this same conclusion was drawn by Olds and Seath[13]. This variation between cows is due largely to the natural physiology of the animal. Not very much data was available for determining causes of variation of cycles within cows on our herd due to the fact that our breeding records are rather incomplete and do not cover a sufficiently long period of time to draw many substantially accurate conclusions. However, I was able to determine that most of the variation within our cattle was due to the following conditions other than heredity. Of the 45 cows presently in our herd which have had more than one calf, 31.11% have exhibited persistent yellow bodies at one time or another and 26.66% had cystic ovary conditions. According to these figures, these two factors alone are the major causes of cycle variations in our herd. Other factors such as age and condition, etc., have some effect in causing variations within cows.

## Conclusion

The results of this study show that some measure of breeding difficulty is present in the Delaware Valley College herd which in turn gave a below average rate of breeding efficiency. The principle factors which contributed to this low rate of efficiency were determined to be difficulties in the reproductive organs of the females and a low conception rate resulting from artificial service.

One may conclude that more attention must be paid to this phase of the dairy enterprise if economical production and reproduction are to be attained. More emphasis should be placed on management because it is only through efficient management that good reproductive efficiencies can be attained. Animals must be bred at the proper time to the right bull, kept in the proper condition both physically and environmentally, and must be treated immediately if abnormalities occur; otherwise, efficient reproduction will be virtually impossible. Proper management of records is as important as proper management of the animals. In addition, the conventional production records, breeding and estrus cycle records, should be kept. By keeping breeding records, i.e., what bull was used on what cow, how many services were required for a given cow to conceive, and what reproductive difficulties, if any, were present in that cow, one can determine more accurately if it is economical to keep a cow in the herd. In addition to this, records should be kept on the occurrence of heat, which would eliminate much of the guess work in detecting heat and which would eliminate nearly all of the undetected heats.

The result of this practice of accurate record keeping will be a higher percentage of breeding efficiency which will mean economical reproduction and production.

| BULL | SERVICES | CONCEPTIONS | BREEDING EFFICIENCY |
|---|---|---|---|
| Duke | 46 | 28 | 1.64 |
| Conqueror | 28 | 12 | 2.33 |
| Angus | 20 | 11 | 1.66 |
| Excellency | 25 | 8 | 3.12 |
| Woodmaster | 33 | 14 | 2.36 |
| Sir Robuake | 16 | 5 | 3.20 |
| Lilac Hill Ravin Design | 1 | 0 | 0.00 |
| Dunlogen Master | 1 | 0 | 0.00 |
| Sir Johanna | 3 | 1 | 3.00 |
| Mister | 12 | 4 | 3.00 |
| Dauntless | 4 | 3 | 1.33 |
| Last Master | 2 | 1 | 2.00 |
| Jess Pabst Ledger | 1 | 1 | 1.00 |
| Roburke Joe | 1 | 1 | 1.00 |

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# AUTOMATED MACHINE

*With the dairy industry becoming more mechanized, more complex, and more automated, an evolution is overtaking the dairy farmer.*

*He no longer has the personal touch with his animals that he had perhaps twenty years ago. He now thinks in terms of machines and automation.*

*At present an animal is described by its physical appearance. How will a farmer fifty years from now describe his animal? With a great deal of foresight, and with tongue in cheek, we present a future dairyman's description of his milk producers.*

*Editor*

"A Cow is a completely automated milk manufacturing machine. It is encased in untanned leather and mounted on four vertical movable supports, one on each corner."

"The front end of the machine contains the cutting and grinding mechanism, as well as headlights, dog catchers, air inlet and exhaust, a bumper and a foghorn."

"At the rear, the machine carries the milk-dispensing apparatus as well as an automatic fly swatter and insect repeller."

"The central portion houses a hydrochemical conversion plant. Briefly, this consists of four fermentation and storage tanks connected in series by an intricate network of flexible plumbing. This part also contains the central heating plant, complete with automatic controls, pumping station, and main ventilating system. The waste-disposal apparatus is located to the rear of this section."

"Cows are available in an assortment of sizes and colors. Production output ranges from two to twenty tons of milk per year."

"In brief, the main externally visible features of the cow are: two lookers, two hooders, four stander-uppers, four hanger-downers, and a swishy-wishy."

"There is a somewhat similar machine known as a Bull, which should not be confused with a cow. It produces no milk, but it has other interesting uses."

*(Reprinted from Journal of Machine Accounting.)*

CARELESS GUYS USUALLY GET STUNG IN THE END

**GATEWAY**—from page 13

There are many attractions to hold the tourist's interest. Golf, tennis, fishing, riding and skiing on both water and snow are among the many active sports that can be pursued against backdrops of great scenic beauty. The main cities all have arenas for soccer, basketball, and the finest bullfighters of the world.

At the east side of Bogota the monumental salt mines at Zipaquira have been carved into giant Byzantine arch formations to make an underground cathedral. While within a few hours drive from Bogota are the famous Tequendama falls, which spill more than 400 feet in a graceful cascade.

North American travelers have discovered in Colombia an infinite variety of attractions. New hotels are rising all over the country. The Tequendama Hotel in Bogota, operated by International Hotels, has been booked almost to capacity since it opened six years ago. Work began in April on the Bogota Hilton, outside the capital city, near the new international airport of El Dorado.

The history of agriculture in Colombia today is the story of coffee paradoxes and land reform.

Colombia depends on agriculture for 40% of its income. Coffee accounts for better than 80% of its exports, and coffee is in a rapidly changing world market which can and frequently does produce staggering price flunctuations.

More than 7,000,000 bags of mild coffee were shipped abroad last year. United States imports of Colombian Coffee rose 14% over last year's but the dollar value was down because of the falling prices. Per capita consumption of coffee in Europe is growing more than twice as fast as in the States, but imports still remain relatively small because of traditional ties with African producers and high internal taxes on coffee.

The future development of Colombian agriculture lies in sharply increasing coffee production per acre while removing marginal lands from production and shifting this acreage to other uses.

Colombia has made outstanding progress recently. A stable government, a sound currency, increased agricultural and industrial production, all promise well for the future.

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